

On the conditions of observation ... S/503/61/012/000/001/007  
E032/E514

and hence

$\theta, ^\circ$	0	30	90	180
P, %	50	54.4	50	0


Thus, the overall degree of polarization is large and very nearly constant right down to  $0^\circ$ . However, under real conditions the polarization by dust matter should be much smaller. Thus, for example, Ye. V. Pyaskovskaya-Fesenkova (Ref. 5: Izvestiya Astrofizicheskogo instituta AN KazSSR, 1959, v. 8) has succeeded in separating the scattering indicatrix of dry aerosols in the Libyan Desert into functions representing light vibrations in the above two mutually perpendicular planes. If these results are employed, then the polarization distribution is found to be

$\theta, ^\circ$	0	10	20	30	40	50	60	90	120
P, %	23.5	24.2	26.1	28.0	29.7	31.0	31.8	30.8	23.4

The next problem is to separate the zodiacal light from the  
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On the conditions of observation ... S/503/61/012/000/001/007  
EO32/E514

background sky intensity. It is pointed out that the conditions which pertain during total eclipse are very similar to those giving rise to sky illumination during sunrise and sunset. Therefore, the author's theory of twilight can be used to compute the background intensity. A general description is given of how the background intensity can be taken into account. There are 1 figure and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc.



Card 5/5

3937  
S/035/62/000/007/051/083  
A001/A101

3.1550

AUTHOR: Fesenkov, V. G.

TITLE: On the nature of comets and conditions of their falling on Earth

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 7, 1962, 76-77,  
abstract 7A550 (In collection: "Meteoritika", no. 21, Moscow,  
1961, 3-14)

TEXT: The upper limit of comet mass, determined from the absence of perturbations, is equal to  $10^{12}$  ton. Assuming that their cores represent compact swarms of individual particles, their sizes can be estimated from the known brightness of the comets as being 1 cm. Small sizes of particles are corroborated also by polarization of cores, similar to that of aerosols. Absence of bolides in meteoric streams originated by comets indicates uniformity of particles. According to Roche's criterion, the core is not a bound whole at a small distance from the Sun. Cometary spectra indicate the presence of CO, CH, CN, etc. easily evolving at a temperature below  $0^{\circ}\text{C}$ , which also confirms the disperse nature of the core. Passing through perihelion, even high-melting particles of the core evaporate and then condense again. Accelerations of some comets are explained by reactive momenta.

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On the nature of comets and...

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which the core particles experience during evaporation. At present it is established that the character of orbits of both long-periodic and short-periodic comets agrees with the notion of the origin of these bodies from the field of parabolic comets. Condensation of cometary core particles in interstellar conditions is doubtful. More probable is their formation in the protoplanetary cloud or during a Sun passage across a cloud of cosmic dust. Initially high-melting elements condense into particles, then hydrogen forms a thin layer around to which occlude atoms of other elements. Formation of a  $H_2O$  grain of  $0.5 \mu$  size will take ~1,000 years. Cometary particles will represent complicated aggregates of metallic and silicate grains with stuck molecules of water,  $CH$ , etc. A compact clustering of such particles serves as a core of a nonperiodic comet. In encountering with the Earth, the comet will disintegrate in the atmosphere, even at a great mass, as a result of the enormous area of the cross section, giving rise to a powerful air shock wave. Its remains will fall on Earth merely in disintegrated state. There are 13 references.

I. Zotkin

[Abstracter's note: Complete translation]

Card 2/2

FESZENKOV, V.G. [Fesenkov, V.G.] (USSR); KRINOV, E.I. (USSR)

Was the so-called Tungus meteorite a comet? Elet tud 16 no.21:664-  
666 21 My '61.

FESENKOV, V.G.

Man in space means the beginning of a new era in the development  
of science. Astron.zhur. 38 no.2:1-IV Mr-Apr '61. (MIRA 14:4)  
(Astronautics)  
(Cosmic physics)

FESENKOV, V.G.

Cometary nature of the Tunguska meteorite. Astron.zhur.  
38 no.4:577-592 J1-Ag '61. (MIRA 14:8)

1. Astrofizicheskiy institut AN Kazakhskoy SSR,  
(Podkamennaya Tunguska Valley—Meteorites)

S/033/61/038/006/001/007  
E133/E435

AUTHOR: Fesenkov, V.G.

TITLE: On the density of meteoric material in interplanetary space and the possible existence of a dust cloud round the Earth

PERIODICAL: Astronomicheskiy zhurnal, v.38, no.6, 1961, 1009-1015

TEXT: The mass of meteoric material, collected by the Earth, is given by F. Watson (Ref.1: Between the Planets, 1948; Harv. Observ., v.105, 1937, 623) as  $0.36$  to  $4.6 \times 10^6$  tons per year. E. Whipple (Ref.2: Paper presented at the Astronautical Symposium, San Diego, 1956) gives the figure  $0.7 \times 10^6$  from a study of visual and photographic meteors. An alternative approach is via a study of the cosmic dust in the atmosphere (Ref.3: H. Pettersson, Scient. Amer. v.202, no.2, 1960). This gives a figure of  $14 \times 10^6$  tons per year but is very uncertain. Again, the meteoric dust found in deep sea deposits indicates a gain of about  $5 \times 10^6$  tons per year (Ref.4: H. Petterson and Rotshi, Geochim. et cosmochim. acta, 1950). The author first of all considers how much material should be collected from interplanetary space by the Earth. This depends on whether it is assumed that the material is stationary or not.

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On the density of meteoric ...

He calculates that there should be either  $2.79 \times 10^3$  or  $0.535 \times 10^3$  particles/km<sup>3</sup>, for an assumed relative velocity of the Earth and interplanetary medium of 30 and 5 km/sec respectively. (The average radius of a particle is assumed to be  $10 \mu$ .) The material density can also be deduced from the zodiacal light. This can be done by finding the brightness of the light, calculating the optical depth and, hence, finding the particle density. The author shows that the order of magnitude of the result does not depend on the particular scattering function used. Assuming the brightness of the zodiacal light to be 25 fifth magnitude stars per unit solid angle, he obtains an optical depth of  $6.73 \times 10^{-8}$  for 1 A.U. The corresponding particle density can only be calculated if the particle distribution with size and the scattering coefficient variation with size are known. It is assumed that the former is given by

$$\frac{dN}{dr} = ar^{-4}$$

and the latter is proportional to  $r^\beta$ , where  $\beta = 2$  for  $r \geq 0.5 \mu$ .

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On the density of meteoric ...

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The total mass of dust within the limits of the Earth's orbit is then found to be  $1.61 \times 10^{18}$  g, i.e. considerably less than is given by the direct methods mentioned at the beginning of the article. This suggests that the Earth is surrounded by an increased concentration of dust. If we assume that particles in this dust cloud are broken up by the action of solar radiation, and so form a tail, we can also explain the counter glow. There are 1 table and 4 non-Soviet-bloc references. The four references to English language publications read as follows: Ref.1: Ref.2: Ref.3: - all as quoted in text; Ref.5: J. Wood, Astrophys. J., no.1, 1958.

SUBMITTED: August 10, 1961

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FESENKOV, Vasilii Grigor'yevich, akademik; DAGAYEV, M.M., red.;  
KADER, Ya.M., red. 1zd-va; ROGUNOVA, L.A., red. 1zd-va;  
KUZ'MIN, I.F., tekhn. red.

[Solving the riddles of the planets] Razgadyvaia tainy planet.  
Moskva, Voenizdat, 1962. 94 p. (MIRA 16:6)  
(Planets)

S/913/62/003/000/001/033  
D405/D301

AUTHOR: Fesenkov, V.G.

TITLE: On the importance of atmospheric optics for astrophysics

SOURCE: Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Trudy. v. 3, 1962. Rasseyaniye i polarizatsiya sveta v zemnoy atmosfere; materialy Soveshchaniya po rasseyaniyu i polarizatsii sveta v atmosfere. 6 - 13

TEXT: Various general problems of astrophysics are discussed, as well as some special problems of atmospheric optics and their relation to astrophysics. First, atmospheric refraction and extinction are considered. The factors on which atmospheric extinction depends are listed. The effect of altitude refraction-dispersion is dealt with in more detail. The study of the telluric spectrum of planets is stressed. Further, various properties of aerosols are considered. With regard to the altitude distribution

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On the importance ...

of aerosols it can be assumed that at higher levels aerosols of cosmic origin predominate, which are distinguished (as evident from various rocket samples) by a particularly loose structure; that the concentration of small aerosols increases with altitude is also shown by the increasing degree of polarization at the world pole for a very low position of the Sun near the horizon. Some astrophysical problems related to the study of aerosols are reviewed. Further, several topics discussed at the International Symposium on Radiation (Vienna, 14 - 19 August 1961) are dealt with. At this Symposium K.Ya. Kondrat'yev proposed a new method of solution to the problem of heat exchange in the bottom layer of the atmosphere that makes allowance for turbulent and radiant heat-flow. He also presented a paper on the theory of vertical temperature distribution at high altitudes (30-80 km). Other papers, presented by participants from the U.S.A., Great Britain, etc., are also reviewed, in particular the works dealing with the reflectivity of the Earth's surface. Finally, the interaction between the upper layers of the Earth's atmosphere and the surrounding interplanetary matter is discussed. It was found by the author that the optical

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On the importance ...

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properties of the Earth's atmosphere above 150 km are already  
entirely determined by the light scattering from dust particles.

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S/913/62/003/000/029/033  
D405/D301

AUTHOR:

Pesnikov, V.G.

TITLE:

On twilight method of investigation of  
optical properties of atmosphere

SOURCE:

Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy  
institut. Trudy. v. 3. 1962. Rasseyaniye i  
polarizatsiya sveta v zemnoy atmosfere; materialy  
Soveshchaniya po rasseyaniyu i polarizatsii  
sveta v atmosfere. 214 - 233

TEXT:

The applicability of the twilight method to the  
study of the optical properties of the upper atmosphere depends on  
the degree of accuracy of estimating the tropospheric component.  
Moreover, weaker twilight is also affected by zodiacal light and by  
the general brightness of the night sky. The determination of the  
tropospheric component can be facilitated by observing the twilight  
simultaneously at two symmetrical points of the solar vertical at  
an elevation of  $20^{\circ}$  above the horizon. It is noted that the tropo-

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On twilight method of ...

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spheric component is fairly small (10%). A very simple working model is described which is used for evaluating the primary twilight. The calculated brightnesses at various celestial points, corresponding to different zenith distances of the Sun, were used for constructing the isophotic curves of primary twilight. In addition, average brightness curves were obtained by observations at the above-mentioned symmetrical points, a specially-designed electrophotometer was used for this purpose. The first series of observations was conducted in May 1961 by P.N. Boyko. The results show that the normal distribution of gas density with height does not agree with twilight observations. At great altitudes the second atmospheric component is by far the predominant one (as compared to the ordinary atmospheric component); this component consists of dust. Hence it can be assumed that the Earth's atmosphere is filled with dust aerosols (of apparently cosmic origin) whose concentration decreases slower with altitude than that of the ordinary gaseous atmosphere; consequently it becomes optically predominant at altitudes above 80 - 90 km. This dust component is apparently the interior layer of an overall dust envelope surrounding the Earth and extending for many tens of thousands of km. Thus,

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On twilight method of ...

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systematic twilight observations could be used for determining the rate of precipitation of cosmic dust in the atmosphere, the overall aerosols concentration in it, etc. The applicability of the above method of accounting for the tropospheric component is limited to cases in which the solar depression is larger than  $5 - 6^\circ$ . Another method is proposed for estimating the tropospheric component in the case of bright twilight. This method is based on the fact that the degree of polarization of multiply-scattered light is very small or practically negligible in the case of sufficiently bright twilights. There are 9 figures.

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FESENKOV, V.G.

Nature and origin of comets. Astron.zhur. 39 no.4:583-590  
Jl-Ag '62. (MIRA 15:7)  
(Comets)

S/026/62/000/008/002/005  
D050/D113

AUTHOR: Fesenkov, V.G., Academician

TITLE: The nature of the Tungus phenomenon. Not a meteorite, but a comet

PERIODICAL: Priroda, no. 8, 1962, 24-31

TEXT: The author discusses the cause of the Tungus phenomenon and, based on accumulated data and research recently conducted by the Komitet po meteoritam AN SSSR (Committee on Meteorites, AS USSR), the Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR (Institute of Geochemistry and Analytical Chemistry im. V.I. Vernadskiy, AS USSR), the Pochvennyy institut (Soil Institute) and the Glavnyy botanicheskiy sad AN SSSR (Main Botanical Garden, AS USSR), he concludes that it was caused by the fall of a comet. His hypothesis is based on: (1) the orbital motion of the Tungus cosmic body - a motion characteristic of comets only; (2) the direction of the fall; (3) the existence of a tail pointing away from the Sun; (4) lack of meteoric matter at the place of collision; (5) increased luminosity of the nocturnal sky, observed soon after the collision; (6) the noticeable dimness of the Earth's atmosphere, caused by comparatively coarse particles. Investigations are continuing. There are 9 figures and 1 table.

Card 1/1

LEBEDKINA, Ye.D.; FEDOROV, V.M.; FAYNBERG, V.Ya., kand.fiz.-matem.nauk;  
BARCHUKOV, A.I., kand.tekhn.nauk; FESENKOV, V.G., akademik;  
KUCHEROV, V.F., doktor khim.nauk; DZERDZEYEVSKIY, B.L., prof.;  
SHAPIRO, G.S., doktor tekhn.nauk; KUIAGINA, O.S.; UDAL'TSOVA, Z.V.,  
doktor istor.nauk; LIKHACHEV, D.S.

Brief notes. Vest. AN SSSR 32 no.1:119-130 Ja '62. (MIRA 15:1)  
(Scientific societies) (Research)

FESENKOV, V.G., akademik

Flights to the moon and Mars to follow. Priroda 51 no.9:21-22  
S '62. (MIRA 15:9)

(Space flight to Mars)  
(Space flight to the Moon)

S/259/62/000/012/002/002  
E073/E155

AUTHOR: Fesenkov, V., Academician

TITLE: The mysteries of the planet Mars. Present views and hypotheses

PERIODICAL: Nauka i tekhnika, no.12, 1962, 38-39

TEXT: Lovell postulates a regular network of artificially built canals on Mars, but the French astronomer Antoniade has shown that no regular network of canals exists and that the individual canals do not represent continuous lines. This was fully confirmed by Leroy and Dolfuss of the Pic du Midi Observatory. N.F. Barabashov in Khar'kov found that the Martian seas which looked green compared to the reddish deserts have in reality a reddish tinge when compared with a white screen. Furthermore, their spectra do not contain the slightest indication of chlorophyll bands which must exist in highly developed plants on Earth. G.A. Tikhov has for many years visited various zones of the USSR, to elucidate the spectral features of light reflected from plants under various climatic conditions. He concluded that the intensity of such bands largely depends on seasonal and climatic conditions.

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The mysteries of the planet Mars. ...

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Under the extremely severe conditions of Mars, the plants could perhaps have acclimatised themselves so as to lose as little of the solar radiation as possible. The reflectivity of the dark spots on Mars would therefore be very small, particularly in the red and infrared, which is in great contrast to conditions on Earth. However, the existence of plants runs counter to other facts: in the atmosphere of Mars no molecular oxygen or water vapour could be detected, even a thousandth of that found on Earth. This tells against the existence of highly developed plant life which could also support animal life. Photometric observations of V.V. Sharonov, N.N. Sytinskaya, N.P. Barabashov and others show that Martian "seas" as well as deserts have fully analogous properties as regards the nature of their reflected light. This further discounts the existence of plant life, which is always distinguished by rich branchings or shapes. Analysis of the thermal conditions of the light and dark regions on Mars, and comparison with the appropriate reflectivities, also seem to preclude plant life. On absorbing solar radiation the Martian "seas" heat up, like an inorganic body, whereas living matter always uses up the high-frequency solar energy for chemical

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The mysteries of the planet Mars. S/259/62/000/012/002/002  
E073/E155

transformations and not for simple heat rise. The theory that plant life exists on Mars largely derives from the invariance and stability of the dark spots on Mars, claiming that if they did not contain plants they would become covered by sand-storms which from time to time occur on Mars. This view is not well founded, since on Earth areas without plants nevertheless exhibit considerable differences in reflectivity (Libyan Desert, the Aswan-Sudan area). Also, comparison of recent photographs with photographs made during the last century show great changes. McLaughlin proposed to connect the formation of "seas" with volcanic activity and tried to relate the relief of the sea to the direction of wind in the Martian atmosphere. From his polarimetric measurements, Dolfuss tried to show that on Mars liquid water cannot exist and is directly transformed into vapour. According to Kiss, all the observed features on the surface as well as in the atmosphere of Mars can be explained by various nitrogen compounds, and under these conditions no organic life can exist. However, during the great oppositions in 1956 and 1958, the existence of simple organic carbohydrate compounds was detected, particularly in the

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The mysteries of the planet Mars. ... S/259/62/000/012/002/002  
E073/E155 ✓

dark spots of Mars. Such methane-type compounds can form also during volcanic activity but the facts that they are invariably connected with the dark "seas", i.e. the surface of the planet, and that they are not present in the spectrum of any plant life, suggest organic life on Mars. The author concludes that there are no higher plants and animals on Mars but allows that lower primitive forms of each may exist. There are 3 figures.

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FESENKOV, V.G., akademik, otv. red.; KRINOV, Ye.L., zam. otv.  
red.; RAKHLIN, I.Ye., red. izd-va; TIKHOMIROVA, S.G.,  
tekhn. red.

[Sikhote-Alin' iron meteorite shower] Sikhote-Alinskii,  
zheleznyi meteoritnyi dozhd'. Moskva, Izd-vo AN SSSR.  
Vol.2. 1963. 370 p. (MIRA 16:11)

1. Akademiya nauk SSSR. Komitet po meteoritam.  
(Sikhote-Alin' Range—Meteorites)

AMBARTSUMYAN, V.A., akademik; ASRATYAN, E.A.; BOGOLYUBOV, N.N., akademik; VINOGRADOV, A.P., akademik; GINETSINSKIY, A.G.; KNUHYANTS, I.L., akademik; KOCHETKOV, N.K.; KURSANOV, A.L., akademik; MEL'NIKOV, O.A.; NESMEYANOV, A.N., akademik; NESMEYANOV, An.N., doktor khim. nauk; OBREIMOV, I.V., akademik; POLIVANOV, M.K., kand.fiz.-mat.nauk; REUTOV, O.A.; RYZHKOV, V.I.; SPITSIN, V.I., akademik; TAMM, I.Ye., akademik; FESENKOV, V.G., akademik; FOK, V.A., akademik; SHCHERBAKOV, D.I., akademik; FRANK, I.M.; FRANK, G.M.; KHOKHLOV, A.S., doktor khim. nauk; SHEMYAKIN, M.M., akademik; ENGEL'GARDT, V.A., akademik; SHAPOSHNIKOV, V.N., akademik; BOYARSKIY, V.A.; LIKHTENSHTEYN, Ye.S.; VYAZEMTSEVA, V.N., red.izd-va; KLYAYS, Ye.M., red.izd-va; TARASENKO, V.M., red.izd-va; POLYAKOVA, T.V., tekhn. red.

[As seen by a scientist: From the Earth to galaxies, To the atomic nucleus, From the atom to the molecule, From the molecule to the organism] Glazami uchenogo: Ot Zemli do galaktik, K iadru atoma domolekuly, Ot molekuly do organizma. Moskva, Izd-vo AN SSSR, 1963. 736 p. (MIRA 16:12)

1. Akademiya nauk SSSR. 2. Chlen-korrespondent AN SSSR (for Asratyan, Ginetsinskiy, Kochetkov, Mel'nikov, Reutov, Ryzhkov, Frank, I.M., Frank, G.M.)

(Astronomy) (Nuclear physics) (Chemistry) (Biology)

S/033/63/040/001/005/016  
EO32/E314

AUTHOR: Fesenkov, V.G.

TITLE: Reduction of photometric observations of zodiacal  
light for the effect of tropospheric scattering

PERIODICAL: Astronomicheskii zhurnal, v. 40, no. 1, 1963,  
31 - 37

TEXT: It is supposed that each element of zodiacal light may be regarded as an external source of light illuminating the Earth's atmosphere in a way similar to that of the Sun. An algebraic procedure is outlined whereby a reduction factor  $K$ , by which the observed brightness of the zodiacal light, freed from the effects of ionospheric and stellar components, must be multiplied in order to obtain its true brightness, which will then include only the effect of the ordinary atmospheric extinction. The procedure involves numerical evaluation of integrals containing scattering functions, intensity distributions and functions of geometrical parameters. The scattering indicatrix for the Earth's atmosphere is taken to be of the form

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FESENKOV, V.G.

Table for the reduction of photometric observations of zodiacal  
light for the effect of tropospheric scattering. Astron. zhur.  
40 no.5:882-888 S-O '63. (MIRA 16:11)

FESENKOV, V.G.

Isophotes of the zodiacal light from observations made in  
Egypt in the fall of 1957. Astron.zhur. 40 no.6:1085-1094  
N-D '63. (MIRA 16:22)

FESENKOV, V.G., akademik

Mars and organic life. Priroda 52 no.2:22-26 '63.

(MRA 16:2)

(Mars (Planet)) (Life on other planets)

FESENKOV, Vasilii Grigor'yevich; FAYNBOYM, I.B., red.

[Life in the universe] Zhizn' vo Vselennoi. Moskva, Izd-vo  
"Znanie," 1964. 53 p. (Novoe v zhizni, nauke, tekhnike.  
IX Seriya: Fizika, matematika, astronomia, no.8)  
(MIRA 17:5)



ACCESSION NR.: AT4035826

8/2534/64/000/024/0034/0036

AUTHOR: Fesenkov, V. G. (Academician)

TITLE: Meteorites and the problem of the origin of the elements in a galactic system

SOURCE: AN SSSR. Komitet po meteoritam. Meteoritika, No. 24, 1964, Trudy\* Desyatoy Meteoritnoy konferentsii v Leningrade 29 maya - 1 iyunya 1962 g., 34-36

TOPIC TAGS: galaxy, supernova, heavy element, element, radioactive dust, galactic system, meteorite, radioactive decay

ABSTRACT: The radioactive decay of elements is one of the simplest and most regular irreversible processes in nature; it has been concluded that radioactive elements and therefore all the heavy elements involved in the earth's formation and in the formation of the other planets, have an age of only 5-6 billion years, that is, considerably less than the estimated age of our Galaxy. It has been shown on the basis of the best available evidence that the only known process capable of creating heavy elements, including radioactive elements, is the explosion of a supernova. Such phenomena are rare in the present-day Galaxy — approximately one such event per hundred years. But it appears difficult to assume that these rare supernovae can supply the galactic need for such elements. It is probable

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that such processes can occur in the galactic center, which constitutes a gigantic and unusually compact spherical cluster where the stars can be as close together as a few astronomical units. Burbidge has postulated that if a supernova explodes in such a compact cluster other stars can be affected like in a chain reaction. As a result there will be a gigantic explosion with the ejection into outer galactic space of matter consisting in part of forming heavy elements. Although hypothetical, this idea nevertheless is confirmed by modern data on so-called peculiar radio galaxies.

ASSOCIATION: Komitet po meteoritam, Akademiya nauk SSSR (Committee on Meteorites, Academy of Sciences, SSSR)

SUBMITTED: 00

DATE ACQ: 28May64

ENCL: 00

SUB CODE: AA

NO REF SOV: 000

OTHER: 000

Card 2/2

ACCESSION NR.: AT4035828

S/2534/64/000/024/0061/0063

AUTHOR: Fesenkov, V. G. (Academician)

TITLE: The nature of comets

SOURCE: AN SSSR. Komitet po meteoritam. Meteoritika, No. 24, 1964. Trudy\*  
Desyatoy Meteoritnoy konferentsii v Leningrade 29 maya - 1 iyunya 1962 g., 61-65

TOPIC TAGS: astrophysics, comet, cometary head, comet formation, Tungus meteorite

ABSTRACT: It has become obvious in recent years that the Tungus meteorite was in fact a small comet; study of the Tungus meteorite can therefore yield much information concerning the nature of comets. However, study of the Tungus comet or meteorite requires that investigators approach their work with a clear understanding of the characteristics of comets; this paper is a brief review of this problem. Comets are either periodic or nonperiodic, but it can be assumed that all have the same chemical composition, internal structure and degree of instability. On this basis it can be assumed that all have a common origin. S. K. Syrovatskiy, has postulated that comets in the form of compact "swarms" of more or less large particles could be ejected from the major planets or their satellites; the formation of comets is one of the manifestations of cosmic vulcanism. However, the possibility of all comets developing in this manner is most improbable. The out-

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standing characteristic of comets, instability, is discussed. Observations indicate that cometary nuclei do not consist of solid masses, but of compact clusters of particles capable of yielding great quantities of gases. The contention of various authors that a comet can contain ordinary meteors is incorrect. Cometary nuclei consist of loosely connected matter capable of turbulent evaporation when subjected to small heating and ejecting finely disperse matter and various gases, such as CH, C<sub>2</sub>, C<sub>3</sub>, CN and in some cases CO. Intensity distribution in cometary spectra corresponds to the solar spectrum. Estimates of the possible mass of a typical comet should be based on use of those parameters in which the entire mass is manifested. Certain comets experience a jump in their orbital acceleration. Other characteristics of comets are given. Comets can form only at very low temperatures, at great distances from the sun, for all practical purposes in interstellar space. Orig. Art. has: 3 formulas.

ASSOCIATION: Komitet po meteoritam, Akademiya nauk SSSR (Committee on Meteorites, Academy of Sciences, SSSR)

SUBMITTED: 00

DATE ACQ: 28May64

ENCL: 00

SUB CODE: AA

NO REF SOV: 003

OTHER: 008

Cerd 2/2

ACCESSION NR: AT4035840

S/2534/64/000/024/0177/0179

AUTHOR: Fesenkov, V. G. (Academician)

TITLE: Anomalous light phenomena associated with the falling of the Tungus meteorite

SOURCE: AN SSSR. Komitet po meteoritam. Meteoritika, no. 24, 1964. Trudy\* Desyatoy Meteoritnoy konferentsii v Leningrade 29 maya - 1 iyunya 1962 g., 177-179

TOPIC TAGS: Tungus meteorite, meteorite, atmospheric phenomenon, comet, cosmic dust

ABSTRACT: A sharp increase in the luminosity of the night sky on 30 June 1908 was observed over an extensive area. It was characterized by an increase in the intensity of the continuous spectrum and therefore was caused by the scattering of sunlight on dust particles in the earth's atmosphere. Before the falling of the Tungus meteorite the brightness of the night sky was normal, and the night of 29 June 1908 was the same. An anomalous brightness of the night sky occurred on 30 June 1908, immediately following the falling of the meteorite. A day later this brightness had decreased by a factor of 10 and then disappeared completely. The anomalous brightness extended on that day only as far west as Ireland and only as

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ACCESSION NR: AT4035840

far east as Vanavara. This indicates that the phenomenon was caused by a cloud of cosmic dust penetrating into the atmosphere, originating from the site of falling of the Tungus meteorite and moving in a direction away from the sun. These dust particles were associated with the meteorite even before its encounter with the earth and moved away from the earth at a velocity which was very small in comparison with the earth's orbital velocity. The source of particles obviously was the tail of a comet. The position of the southern boundary of the anomalous brightness indicates that the particles of the tail of the Tungus comet were held at a height of about 600 km and then were carried back into space under the influence of light pressure. Conditions therefore quickly returned to normal. It is noted that many authors have attributed many optical phenomena to the falling of the meteorite, but without justification. A change in the optical properties of the daytime sky and a general significant increase in atmospheric extinction over an extensive part of the earth set in only considerably later than the falling of the meteorite. As a result of the explosion at a height of 6-7 km the principal mass of the meteorite was carried off in the lower atmosphere as far as the west coast of the United States, but about two weeks were required for this to occur. These and other considerations are said to be convincing evidence of the cometary nature of the Tungus meteorite. o

Card 2/3

ACCESSION NR: AT4035840

ASSOCIATION: Komitet po meteoritam, Akademiya nauk SSSR (Committee on Meteorites,  
SSSR Academy of Sciences)

SUBMITTED: 00

DATE ACQ: 28May64

ENCL: 00

SUB CODE: AA

NO REF SOV: 000

OTHER: 000

Card 3/3

L 14328-65 EWT(i)/ENG(v)/FCC/EMA(d)/EEC-4/EEC(t)/EMA(h) po-4/pe-5/ pq-4/peb/pb-4/  
 Pn-2/Pi-4 ASD(i)-5/AEDC(a)/AFVL/SSD/AFMDC/AFETR/ESD(s)/ESD(t) Cw/Vs  
 ASSIGNMENT NR: AP4046592 570030/54/000/000/0120/0120

AUTHOR: Fesenkov, V. G. (Academician)

TITLE: Problems of the development of meteorics

SOURCE: AN SSSR. Vestnik, no. 9, 1964, 120

107-7130: meteor structure, cosmic radiation, laboratory experiment, apparent meteor motion, terrestrial atmosphere

At the 15th Meteorite Conference called by the Committee of the Academy of Sciences in 1934, the problem of the influence of cosmic radiation on them was discussed. The meteorite problem may be solved only through close and mutual cooperation of astronomers and geophysicists.

June

Card 1/2



L 14318-65  
ACCESSION NR: AP4046592

0  
SUB CODE: AA

UNCLASSIFIED 00

ENCL: 00

NO REF SOV: 000

OTHER: 000

Card 2/2

Pr-5/Pr-1/Pae-2 SSD/AFBR/AFML/ASD(1) GW/JD

ACCESSION NR: AP4047099

S/0026/64/000/010/0002/0007

Author: Prigodov, V. G. (Academician)

TITLE: Meteorites and the origin of the solar system

SOURCE: Priroda, no. 10, 1964, 2-7

TOPIC TAGS: meteorite, meteorite composition, solar system, solar system origin, cosmogony, supernova

ABSTRACT: The many theories of cosmogony, here listed briefly by the author, may be compared with the recent data derived from a study of meteoritic material. Radioisotopes have been used in the past to determine the age of the solar system. The ages can be determined radiactively. All nuclear species investigated lead to an age of  $4.5 \times 10^9$  years. Nuclear synthesis in stars proceeds by fusion of hydrogen to helium and so on to form the lighter elements. Heavier element formation requires the higher temperatures and pressures found in supernova explosions which result in release by shock waves in all directions, thus enriching the interplanetary space in heavy elements. From the present relative abundances of the elements, it is concluded that the solar system is about  $4.5 \times 10^9$  years old.

L 8423-65

ACCESSION NR: AP4047099

0

occurred in our part of the galaxy about 4.5-5 billion years ago, in agreement with the age of the meteorites. This implies that the sun and planets were formed by a single process, to wit, explosion of a nearby supernova. From the rate of decay of  $^{129}\text{I}$ , assumed to be formed in an abundance corresponding to that of  $^{127}\text{I}$ , one can deduce that the time between nuclear synthesis and solidification of asteroidal material was only 200-300 million years. The author then discusses formation of species by fragmentation due to cosmic radiation and short-lived radioactivity. The latter is required to heat the asteroidal material to 900-1000C to explain the crystalline structure. Our sun belongs to the third generation of stars in this galaxy with a different relative abundance of heavy elements from that of older stars. Similar supernova explosions accompanied by shockwaves in interstellar gas are still occurring, as in the case of Cygnus where there is a radial outward movement at 10-20 km per sec from a common point which is a strong radio-source. The stars now forming there will soon move apart, becoming independent but following the same evolutionary path. The associated planets cannot of course be seen. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: AA

Card 2/2

NO REF SIV: 000

OTHER: 000

0011-65 ENT(1)/ENT(7)/FOC/EMA(d)/EEC-L/EEC(t) Pe-5/Pae-2/PI-L SSD/AS(mp)-2/  
ACCESSION NR: AP5401229 AFNL/ESI(t) S/0033/64/041/006/1001/1006 GW

AUTHOR: Fesenkov, V. G.

TITLE: The optical properties of the dust cloud surrounding the earth

SOURCE: Astronomicheskii zhurnal, v. 41, no. 6, 1964, 1001-1006

TOPIC TAGS: optical property, terrestrial dust cloud, equal density surface

ABSTRACT: An attempt was made to calculate, on a purely theoretical basis, the optical properties of the cosmic dust cloud surrounding the earth, as observed from the earth after complete cessation of twilight. It was assumed that the equal density surfaces can be represented by ellipsoids of rotation relative to the plane of the ecliptic, that their degree of flattening is zero in the immediate vicinity of the earth and increases gradually with distance, and that the density of the dust cloud decreases exponentially with distance from the earth. In addition, the calculations required the assumption of a spherical scattering indicatrix and a dust indicatrix obtained from analysis of the scattering of light from atmospheric aerosols at

Card 1/2

L 20101-65

ACCESSION NR: AP5001229

great heights. First, the simplest case in which the ecliptic is vertical to the observer's horizon was considered. It was shown that the brightness depends only on changes in the scattering angle, that is, on the scattering indicatrix, which differs sharply from the situation in respect to zodiacal light, where the axial distribution of brightness is determined essentially by the angular distance from the sun. Similar calculations were made for  $i = 60$  deg and  $\zeta = 110$  deg, where  $i$  is the inclination of the ecliptic to the horizon and  $\zeta$  is the zenithal distance of the sun. Some shift in the maximum of brightness in the horizontal cross section of the dust cloud should be observed when the plane of the ecliptic is inclined sufficiently to the horizon. Orig. art. has: 2 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: AA, OP

NO REF SOV: 001

OTHER: 000

Card 2/2

FESENKOV, V.G.

Orbit. of the Tunguska meteorite. Meteoritika no.25:163-167 '64.  
(MIRA 17:9)

L 52494-65 EEO-2/EWT(d)/FBD/FSS-2/EWT(1)/FS(v)-3/EEC(k)-2/EWA(d)/T-2/EEC(c)-2/EED-2  
 Pa-4/Pc-4/Pd-4/Pac-4/Pg-4/Pae-2/Pi-4/Pk-4/Pl-4 G4/WR  
 COSESSION NR: A75011012 UR/2316/64/COO/039/0016/0017

AUTHOR: Fesenkov, V. G.

TITLE: Observation of artificial satellites in the shadow of the earth

SOURCE: AN SSSR. Astronomicheskii sovet. Byulleten' stantsiy opticheskogo nablyudeniya iskusstvennykh sputnikov Zemli, no. 39, 1964, 16-17

TOPIC TAGS: artificial satellite, satellite tracking, atmosphere, aerosol, ozone, photometry

Observations of satellites in the earth's shadow are important in determining heights of aerosols of atmospheric and cosmic origin and for finding the height distribution of atmospheric ozone. As the satellite enters the earth's shadow its brightness weakens rapidly. This weakening is due to two factors. The first is refraction dispersion, resulting from apparent vertical contraction of the solar disk and, hence from decrease in area. The magnitude of this dispersion depends on the height of the observer (or object) above the earth. The second factor is significant in the effect on artificial satellites and may be accurately computed because our knowledge of atmospheric composition (gases) in the lower few dozen kilometers of the atmosphere is good. The second cause of

Card 1/2



04474-00  
ACCESSION NR: AT5012012

brightness weakening is atmospheric extinction in the layers of the atmosphere, due partly to molecular scattering of light but chiefly to the effect of atmospheric aerosols and ozone. Observations are made at different wavelengths in the visible range to permit discrimination of the different causes, or the proportions of each. Wavelengths suggested are 0.60 microns in the orange region, 0.42-0.45 microns in the violet, and 0.70 microns in the extreme red. Ozone has a maximum in the 0.60 micron region. Observations should be begun before weakening begins, i.e., several degrees before the satellite enters the earth's shadow, in order for proper construction of the photometric curve, to permit proper evaluation of change in brightness.

ASSOCIATION: Astrofizicheskiy institut AN Kazakhskoy SSR, Alma-Ata (Astrophysical Institute, AN Kazakh SSR)

SUBMITTED: 14 Jan 64

ENCL: 00

SUB CODE: AA, ES

NO REF SOV: 000

OTHER: 000

Card

2/2



KULIKOV, Konstantin Alekseyevich; FESENKOV, V.G., akademik, otv. red.

[The first astronauts on the moon; description of the moon  
and the astronomical phenomena observable from its surface]  
Pervye kosmonavty na Lune; opisanie Luny i astronomicheskikh  
iavlenii, nabludaemykh s ee poverkhnosti. Moskva, Nauka,  
1965. 188 p. (MIRA 18:4)

L 41143-66 EWT(1) OW  
ACCESSION NR: AP5024183

UR/0384/65/000/004/0006/0011

AUTHOR: Fesenkov, V. G. (Academician)

TITLE: A solar cometary cloud and the interstellar space

SOURCE: Zemlya i vselennaya, no. 4, 1965, 6-11

TOPIC TAGS: comet, solar system, nebula, hydrogen, interstellar matter, asteroid, planet

ABSTRACT: A treatise is given on the structure and motion of comets and gaseous nebulae, with possible similarities between them. Comets are shown to exist primarily outside the fringes of the solar system in interstellar environments. As they approach the sun, emission spectra show the presence of hydrocarbons, calcium, iron, and other elements. The interaction of the comet with the sun is found to depend on the nature of rotation of its nucleus. Such astronomical studies are insufficient to shed enough light on the nature of comets. An unusual insight could be obtained from possible comet-earth collisions. According to the author, one such collision is believed to have occurred in 1908 with the famous Tunguskiy meteorite, which the author shows to have had all the qualities of a comet. Similar collisions between comets can generate material from which asteroids and eventually planets may

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"APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R000412920012-0"

L 41143-66  
ACCESSION NR: AP5024183

be formed. The various techniques for analyzing gaseous dust nebulae are outlined, and it is shown that from electron density estimates the density of the stellar nebulae can be estimated with fair certainty. Hydrogen is found to be the main constituent of gaseous nebulae. It is concluded that a distinct analogy exists between nebulae, from which stars are believed to have formed, and comet clouds, once very abundant in the solar system, as sources of planetary material. Orig. art has: 6 pictures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: AA

NO REF SOV: 000

OTHER: 000

Card 2/2

FESENKOV, V.G.

Problems related to the physics of interstellar matter  
(opening address). Trudy Astrofiz. inst. AN Kazakh. SSR  
5:247-248 '65. (MIRA 18:6)

L 2980-66 EMT(1)/FCC GW

ACCESSION NR: AP5025625

UR/0033/65/042/005/1084/1089  
525.75

AUTHOR: Pesenkov, V. G.

TITLE: Some properties of the polarization of the day sky

SOURCE: Astronomicheskii zhurnal, v. 42, no. 5, 1965, 1084-1089

TOPIC TAGS: day sky, sky brightness, atmospheric optics, sky polarization, celestial pole

ABSTRACT: Observations conducted at the Mountain Astrophysical Observatory near Alma-Ata in the period 1958-1960 by means of a two-channel polarimeter show that at the point of the celestial pole, the degree of polarization, which varies during the day because of meteorological conditions, increases in value as the sun approaches the horizon. The maximum value for a given solar declination is reached when the sun is on the horizon. This may be attributed to the fact that the effective height of the atmosphere responsible for the brightness of the day sky increases with greater zenithal distance of the sun. At the moment of sunset it has already reached the stratosphere where the optical conditions are little affected by the weather. The fact that the corresponding angle of polarization always corresponds

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I. 2980-66

ACCESSION NR: AP5025625

to the true solar time indicates a weak degree of polarization of the high-order scattering component, at least for the pole point. Computations for the degree of polarization at the pole for one equatorial sky sector yield

$$P_m = 0.385,$$

where the angle of polarization is  $\gamma_m = 7.5^\circ$ . The observed linearity of the angle of polarization with the true solar time shows clearly that the polarization of high-order scattering can be disregarded. Orig. art. has: 6 figures. [DM]

ASSOCIATION: none

SUBMITTED: 20 May 65

ENCL: 00

SUB CODE: ES

NO REF SOV: 002

OTHER: 000

ATD PRESS: 4109

EVK  
Card 2/2

I 32033-66 ET(1)/EGG GW	
ACC NR: AP6019673	SOURCE CODE: UR/0033/66/043/003/0599/0605
AUTHOR: Fesenkov, V. G.	
ORG: Meteoritic Committee, Academy of Sciences SSSR (Komitet po meteoritam Akademii nauk SSSR) <span style="float: right;">23 B</span>	
TITLE: <sup>12</sup> Interplanetary dust and methods for investigating it	
SOURCE: Astronomicheskii zhurnal, v. 43, no. 3, 1966, 599-605	
TOPIC TAGS: interplanetary dust, zodiacal light, sky brightness, zenithal distance, ecliptic plane, absolute indicatrix, asteroid, isophot system, periodic comet <sup>12</sup>	
ABSTRACT: Interplanetary dust causes <u>zodiacal light</u> , which is spread over the whole sky. Zodiacal light is mainly concentrated near the ecliptic, and its brightness increases with proximity to the sun. The intensity of this light is characterized by isophots and polarization. Isophots are taken from results obtained by scanning the sky brightness at various zenithal distances parallel to the horizon and at various subhorizon positions of the sun. The intensity of sky illumination by reflected light from particles of interplanetary dust can be determined by eliminating the light reflected from air molecules and the luminescence of some gases. The remaining illumination is zodiacal light. The brightness of the zodiacal-light component may be determined by measuring the sky brightness at the pole of the ecliptic and eliminating lines which do not belong to the zodiacal light. These	
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L-32033-66

ACC NR: AP6019673

measurements and the measured polarization make it possible to determine the value of the zodiacal-light component. The brightness of zodiacal light was determined by this method and was found to be equal to  $1/20$  of the sky brightness at the pole of the ecliptic. The distribution of dust around the sun and its density in the place of the ecliptic can be determined by means of a known absolute indicatrix of dust dispersion. Interplanetary dust does not result from the crushing of asteroids because that quantity of dust does not satisfy the isophot system obtained from observations. The stability of the quantity of interplanetary dust is explained by the decay of periodic comets which restores the quantity of dust falling to the sun. Measurements of twilight at two symmetrical points in the sky make it possible to determine the brightness of the zodiacal light which can characterize the optical properties of the terrestrial atmosphere. Orig. art. has: 3 figures and 13 formulas.

[EG]

SUB CODE: 04/ SUBM DATE: 11Dec65/ ORIG REF: 004/ OTH REF: 001/ ATD PRESS: 5019

Card

2/2



L 20514-66 EWT(1)/EWA(d) OW

ACC NR: AP6012059

SOURCE CODE: UR/0384/65/000/006/0002/0009

AUTHOR: Fesenkov, V. G. (Academician)

ORG: none

TITLE: Cosmic dust cloud around the Earth

SOURCE: Zemlya i vseennaya, no. 6, 1965, 2-9

TOPIC TAGS: cosmic dust, moon, meteorite, solar radiation, lunar surface, micrometeorite

ABSTRACT: Academician Fesenkov points out that all data indicate that the earth is surrounded by an extensive dust cloud which is probably of meteoric origin, possibly by no means homogeneous, decreasing in density with increasing distance from the earth. The dust particles of which it consists could not be ejected from the earth's surface and even at a considerable distance from the earth could not escape into universal space because the pressure of solar radiation is negligibly small in comparison with the acceleration of terrestrial gravity. The origin of this cloud still is not entirely clear. Some investigators, such as F. Whipple, feel that it could have been formed by the disintegration of the lunar surface by meteorites falling on the moon at cosmic velocities. In the case of colossal impacts and a relatively small escape velocity (2.38 km/sec) it is easy

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ACC NR: AP6012059

to conceive that an appreciable part of the lunar disintegrated matter would be ejected into space and would enter the sphere of attraction of the far more massive earth. Another possible way in which the dust cloud could be replenished is from the braking of meteors or micrometeorites near the earth or the capture of meteor matter. As already pointed in the article, in addition to the ordinary meteors observed in the atmosphere at heights of about 100 km, there is a far greater number of meteors which simply penetrate the extensive layers of the earth's atmosphere at far greater heights and again enter interplanetary space. There are many such meteor bodies which revolve around the earth for a long time, gradually replenishing the dust cloud. Another possible source is from the braking of cosmic particles. Orig. art. has: 9 figures. [JPRS]

SUB CODE: 03 / SUBM DATE: none

Cord 2/2

200

ACC NR: AP7006059

SOURCE CODE: UR/0384/66/000/004/0018/0022

AUTHOR: Fesenkov, V. G. (Academician)

ORG: none

TITLE: Can comets consist of antimatter?

SOURCE: Zemiya i vseennaya, no. 4, 1966, 18-22

TOPIC TAGS: antimatter, comet, meteor, star

SUB CODE: 03

ABSTRACT: The literature on the possibility of comets consisting of antimatter is reviewed. Academician Fesenkov successively considers the meteor matter in interplanetary space, meteor streams and the penetration of meteor matter into the earth's atmosphere, nature and origin of comets. He notes that in the Galaxy antimatter can be manifested by the release of energy as a result of the annihilation process during collision with ordinary matter. Burbidge and Hoyle, for example, have found that if all the energy of molecular and turbulent motions of the interstellar medium (approximately  $10\text{-}11 \text{ erg/cm}^3$ ) is determined by annihilation, the ratio of antimatter to matter should be less than one-ten-millionth. These authors conclude that the existence of stars consisting of antimatter is extremely improbable and probably impossible. The annihilation of matter should also be accompanied by radio emission. However, observations show that there is no such radio emission from individual interstellar clouds, but only nebulae such as the Crab nebula, nebulae in Cygnus, etc., remnants of supernovae. This and many other facts indicate it is extremely unlikely that antimatter exists in the Galaxy in the form of scattered matter or individual stars. It can be

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ACC NR: AP7006059

concluded that antimatter arises only in the form of individual elementary particles during intensely energetic irradiations of ordinary matter and cannot be concentrated in space as comets or as any other more or less significant masses. Orig. art. has: 1 figure. [JPBS]

Card 2/2

ACC NR: AP7010707

SOURCE CODE: UR/0384/66/000/005/0005/0014

AUTHOR: Fesenkov, V. G. (Academician)

ORG: none

TITLE: Nature of the moon

SOURCE: Zemlya i vseleennaya, no. 5, 1966, 5-14

TOPIC TAGS: lunar temperature, lunar crater, lunar topography, lunar optic property, lunar orbit

SUB CODE: 03

ABSTRACT: Academician V. G. Fesenkov has summarized our current knowledge of the moon in the article cited below. The following subjects, among others, are considered: the earth-moon as a double planet; the gradual withdrawal of the moon from the earth; origin of the moon; tidal evolution of the earth-moon system; the lunar orbit in the past; thermal history of the moon; radar observations of the moon; character of the lunar interior; figure of the moon; history and nature of the lunar surface; causes of changes of lunar relief; possibilities of lunar volcanism; nature of the lunar seas and continents; hypotheses of the formation of lunar craters; influence of cosmic rays and the solar wind; optical properties of the lunar surface. Orig. art. has: 6 figures. (JPRS: 40,291)

Cards 1/1

0950 29107

ACC NR: AP7013154

SOURCE CODE: UR/0025/65/000 012/0082 0082

AUTHOR: Fesenkov, V. G. (Academician; Chairman of Committee); Inshenetskiy, A. A. (Academician; Director of Institute)

ORG: [FESENKOV] Committee on Meteorites, AN SSSR (Komitet po meteoritam AN SSSR); [INSHENETSKIY] Institute of Microbiology, AN SSSR (Institut mikrobiologii AN SSSR)

TITLE: Collection of new meteorites

SOURCE: Nauka i zhizn', no. 12, 1965, 82

TOPIC TAGS: meteorite, meteor observation

SUB CODE: 03

ABSTRACT:

Another feature article in the Soviet press encourages the readers to be vigilant in a search for new meteorites. General information is presented, such as that three meteorites fall to earth annually in each area of a million square kilometers. Only 1,800 meteorites have been discovered throughout the world. The Academy of

Card 1/2

0933 0864

ACC NR: AP7013154

Sciences USSR has a collection of 300 Russian and foreign meteorites, one of the largest in the world. During the past two hundred years only 134 meteorites have been discovered in Russia; about half were observed during falling, while the other half cannot be identified as to date of falling. During the last ten years the Committee on Meteorites of the Academy of Sciences has received only twelve new meteorites. Almost all were found by chance by local inhabitants. The authors emphasize how important it is for people to report suspected meteorite finds to the Academy of Sciences and note that there is an established monetary reward for each find. Particular emphasis is given to the importance of finding newly fallen meteorites that might contain evidence on the existence of life in space. Accordingly, instructions are given on the proper recovery, storage and packing of finds in order to prevent any contamination. It is requested that small (10-20 g) pieces of suspected meteorites be sent to the Academy of Sciences for analysis, while great care is taken to safeguard the main body until a report is given. [JPRS: 34,593]

Card 2/2

FESENKOVA, L.V.

Can there be life on Mars? Zem.i vsel. 1 no.5:57-60 S-0 '65.  
(MIRA 18:11)

FESENKOVA, N. G.

Fesenkova, N. G. - "On the problem of the influence of the mechanical composition of soil on the dynamics of salt formation", Izvestiya Akad. nauk Azerbaydzh. SSR, 1948, No. 10, p. 27-41, (Resume in Azerbaijani).

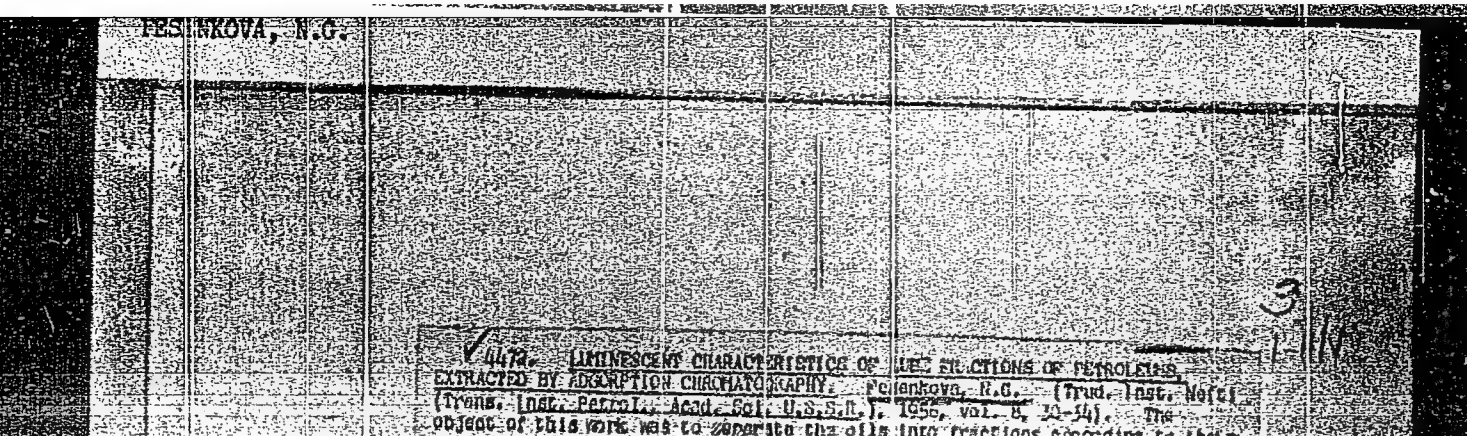
SO: U-3042, 11 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 8, 1949).

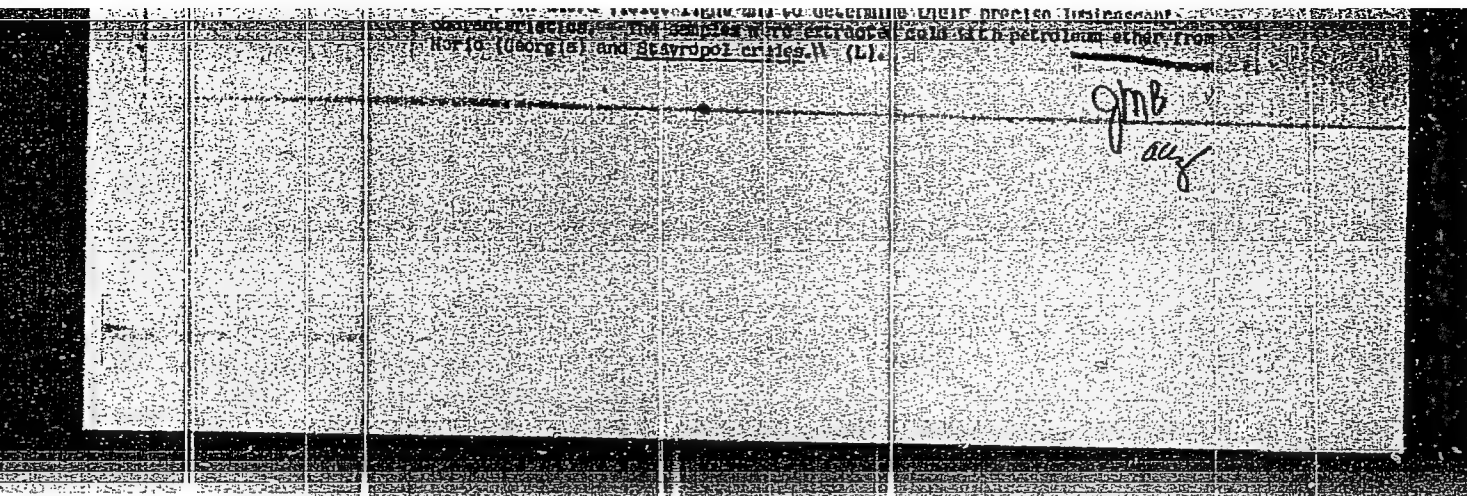


FESENKOVA, N.G.

✓ Phosphorus in sedimentary rocks. N. G. Fesenkova.  
Doklady Akad. Nauk S.S.S.R. 105, 1021-80 (1955). TOTAL  
P, P leachable by HCl, and P leachable by  $\text{NH}_4\text{OH}$  both  
subdivided into org. and inorg. P. and tabulated for  
Tertiary and Cretaceous sediments and for the  
for the sediments ranges between 0.1 and 1.0%  
traces (of the org. P) by  $\text{NH}_4\text{OH}$ . The soils contain 90-  
260 mg. of P/100 g. which is 0-45% org. From 43 to 72%  
can be extd. by 4N HCl and 4N  $\text{NH}_4\text{OH}$ . HCl extg. mostly  
mineral P, and  $\text{NH}_4\text{OH}$  mostly org. P. D. J. Milbrin

*Inst. Petroleum AS USSR*





FESENKOVA, N. S. and DRAPALYUK, Ye. I.

"On the Question of Diagnosing Brucellosis in Sheep." Veterinariya,  
No 6, Jun 56, p 35.

Dnepropetrovsk Oblast Veterinary Bacteriology Laboratory.

USSR/Diseases of Farm Animals. Diseases Caused by  
Bacteria and Fungi.

R-1

Abs Jour: Ref Zhur-Biol., No 18, 1958, 83528

Author : Drapalyuk, Ye. I.; Kulik, I.A.; Solovyeva, Ye. M.;  
Fesenkova, N.S.

Inst : No institute is given

Title : Comparative Diagnostic Values of UIEV [Ukrainian  
Institute of Experimental Veterinary Medicine]  
Tuberculo-protein and of Commercially Produced  
Tuberculin for Cattle.

Orig Pub: Veterinariya, 1958, No 1, 55-59

Abstract: 666 heads of cattle kept in tuberculosis isolators  
and in a conditionally healthy environment were ex-  
amined for tuberculosis with UIEV tuberculo-protein  
and commercially produced tuberculin used simultaneous-  
ly. The first preparation proved more valuable since  
1.3 times more animals reacted to it, and since rea-  
ctions occurred faster, and were more pronounced.

Card1/1

16

*Dnepropetrovsk obshchestvennaya laboratoriya*

MITROPOL'SKIY Yu.A., *ctv. red.*; BEREZANSKIY, Yu.M., *red.*; KOROLYUK, V.S., *red.*; PARASYUK, O.S., *red.*; SOKOLOV, Yu.D., *red.*; FESHCHENKO, F.F., *red.*; FIL'CHAKOV, P.F., *red.*; BREUS, K.A., *red.*; MEL'NIK, T.S., *red.*; BEREZOVSKAYA, D.N., *tekhn. red.*

[Approximate methods of solution of differential equations]  
Priblizhennyye metody resheniya differentsial'nykh uravnenii.  
Kiev, Izd-vo AN USSR, 1963. 153 p. (MIRA 17:3)

1. Akademiya nauk URSR, Kiev. Instytut matematyky.

22267

*deceased*

9.2572

S/109/61/006/005/014/027  
D201/D303

AUTHORS: Siulina, G.A., Peshchenko, G.A. (Deceased)

TITLE: Spin levels of  $Fe^{3+}$  ion in corundum

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 5, 1961,  
806 - 814

TEXT: Good understanding of the electron paramagnetic resonance of the  $Fe^{3+}$  ion in corundum is of great importance in designing paramagnetic amplifiers since, because of small distances between the spin doublet, a small or even no magnetic field, permits the realization of paramagnetic amplifier in the centimetric frequency range as stated in L.S. Korniyenko and A.M. Prokhorov (Ref. 1: ZhETT, 1959, 36, 919), and J.E. King, and R.W. Terhune (Ref. 2: J. Appl. Phys. 1959, 30, 1844). For an arbitrary orientation of axes of the magnetic field and of the trigonal axis, the  $Fe^{3+}$  ions form two magnetic non-equivalent systems according to L.S. Korniyenko and A.M. Prokhorov (Ref. 3: ZhETT, 1957, 33, 805) and G.S. Bogle and  
Card 1/7

Spin levels of ...

22267

S/109/61/006/005/014/027  
D201/D303

H.F. Symmons (Ref. 4: Proc. Phys. Soc. 1959, 73, 531) each producing its own system of lines of various intensities. The richness of this spectrum permits a good study of cross-relaxation phenomena in a paramagnetic amplifier. The original work of analysis of the paramagnetic resonance of the  $Fe^{3+}$  ion in  $Al_2O_3$  was carried out by L.S. Korniyenko and A.M. Prokhorov (Ref. 3: Op.cit.), who showed that the observed spectrum of the electron paramagnetic resonance can be explained by the spin-Hamiltonian as proposed by B. Bleaney and R.S. Trenam (Ref. 6: Proc. Roy. Soc., A., 1954, 223, 1); they also measured its constants at room temperatures. The evaluation of Eigen-values and of wave functions for parallel orientation was done by V.M. Vinokurov, M.M. Zaripov and N.R. Yafayev (Ref. 7: ZhE TT, 1959, 37, 312). In the present article the authors evaluate the numerical values of the levels of energy for an arbitrary orientation of the magnetic field with respect to the trigonal axis in the planes, for which all ions are magnetically equivalent. Numerical results are compiled as tables and graphs which permit determination of the spin levels of ...

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tion of the value of the magnetic field, the orientation of the crystal and the wave length of the subsidiary radiation. This permits design of a paramagnetic amplifier for a given frequency band and evaluation of the probabilities of transition for the main and the subsidiary radiation. The splitting of spin levels of the  $Fe^{3+}$  ion in corundum is described by the spin-Hamiltonian of the form

$$\begin{aligned} \mathcal{H} = & g\beta \vec{H} \vec{S} + \frac{a}{6} [\hat{S}_x^4 + \hat{S}_y^4 + \hat{S}_z^4 - \frac{1}{5} S(S+1)(3S^2+3S-1)] + \\ & + D [\hat{S}_z^2 - \frac{1}{3} S(S+1)] + \frac{1}{180} F [35\hat{S}_z^4 - 30S(S+1)\hat{S}_z^2 + \\ & + 25\hat{S}_z^2 - 6S(S+1) + 3S^2(S+1)^2], \end{aligned} \quad (1)$$

where  $S$  - the effective spin ( $S = \frac{5}{2}$ );  $\hat{S}_x, \hat{S}_y, \hat{S}_z$  - operators of the spin projection on the axes of the co-ordinate systems, for which z-axis coincides with the trigonal axis of symmetry of the crystal field;  $\hat{S}_x, \hat{S}_y, \hat{S}_z$  - operators of the spin projections in the cubic

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system;  $\vec{H}$  - vector of the external magnetic field;  $g$  - coefficient of spectroscopic displacement;  $\beta$  - Bohr magneton;  $D$ ,  $F$  - constants of the electric crystal fields of the trigonal symmetry of the 2nd and 4th order respectively;  $a$  - constant of the electric field of cubic symmetry. The matrices of the spin-Hamiltonian (1) have been evaluated in the case when the diagonal operators are  $S^2$ ,  $S_z$ . Using the three dimensional rotation matrix with  $\theta = 125^\circ 16'$ ,  $\varphi = 225^\circ$ ,  $\psi = 0$ , it can be shown that in  $S_z$  representation the energy matrix has the form of

$$\begin{pmatrix} \frac{10-b}{3} + \frac{\sqrt{5}}{2} h \sin \alpha & 0 & -ic & 0 & 0 \\ + \frac{5}{2} h \cos \alpha & \frac{\sqrt{5}}{2} h \sin \alpha \left[ -\frac{2}{3} + b + \frac{\sqrt{2}}{2} h \sin \alpha \right] & 0 & 0 & 0 \\ \frac{\sqrt{5}}{2} h \sin \alpha & \left[ -\frac{2}{3} + b + \frac{\sqrt{2}}{2} h \sin \alpha \right] & 0 & 0 & 0 \\ + \frac{3}{2} h \cos \alpha & & & & \end{pmatrix} \quad (3)$$

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$$\mathcal{H}_{12} = \begin{pmatrix} 0 & \sqrt{2}h \sin \alpha \left[ -\frac{8+2b}{3} + \frac{3}{2}h \sin \alpha \right] & 0 & ic \\ ic & 0 & \frac{3}{2}h \sin \alpha \left[ -\frac{8+2b}{3} - \frac{h}{2} \cos \alpha \right] & \sqrt{2}h \sin \alpha \\ 0 & 0 & 0 & \sqrt{2}h \sin \alpha \left[ -\frac{2}{3} + b - \frac{3}{2}h \cos \alpha \right] \\ 0 & 0 & -ic & 0 \end{pmatrix} \begin{pmatrix} \frac{\sqrt{5}}{2}h \sin \alpha \\ \frac{\sqrt{5}}{2}h \sin \alpha \left[ \frac{10-b}{3} - \frac{5}{2}h \cos \alpha \right] \end{pmatrix} \quad (3)$$

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where  $h = \frac{g\beta}{D} H$ ,  $b = \frac{a - F}{D}$ ,  $c = \frac{2}{3} \sqrt{5} \frac{a}{D}$  are dimensionless quantities. The Eigen-values are the roots of the secular equation

$$|\mathcal{H}_{ik} - \epsilon \delta_{ik}| = 0, \quad (4)$$

where  $\epsilon = \frac{E}{D}$ . It can be shown that these roots are real numbers. The authors have numerically evaluated in Eq. (4) in the interval  $\alpha = 0 - 90^\circ$ ,  $h = 0 - 5.9$  in steps  $\Delta h = 0.1$ ,  $\Delta \alpha = 5^\circ$ . The behavior of energy levels with the changing magnetic field is graphically represented for  $\alpha = 0^\circ, 30^\circ, 60^\circ$  and  $90^\circ$  respectively. The appendix gives the values of energy of spin levels  $\epsilon_i$  of the  $\text{Fe}^{3+}$  ion in corundum for eight orientations of the external magnetic field relative to the trigonal axis of the crystal ( $\alpha = 0, 15, 30, 45, 60, 75, 90^\circ$ ) in steps  $\Delta h = 0.2$  ( $\Delta H = 364.5$  oersted). It has to be pointed out that in calculations, the value

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$\frac{63}{64} \frac{a - F}{D} + \frac{35}{12} = 3.1104$  has to be added to matrices (3). The authors express their gratitude to A.M. Prokhorov and L.S. Korniyenko for their interest and help. There are 5 figures, an appendix with tabulated numerical results, and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: J.E. King, R.W. Terhune, J. App. 1 Phys., 1959, 30, 1844; G.S. Bogle, H.F. Symmons, Proc. Phys. Soc., 1959, 73, 531; N. Bloembergen, S. Shapiro, P.S. Persham, J.O. Artman, Phys. Rev., 1959, 114, 445; B. Bleaney, R.S. Trenam, Proc. Roy. Soc., A., 1954, 223, 1.

SUBMITTED: March 29, 1960

Card 7/7

KORNIYENKO, L.S.; FESHCHENKO, G.A. [deceased]

Calculation of the matrix elements of the transitions between  
 $\text{Fe}^{3+}$  ion levels in corundum for an important practical case.  
Radiotekh. i elektron 7 no.7:1241-1243 '62. (MIRA 15:6)  
(Paramagnetic resonance and relaxation) (Ferrates)  
(Corundum)

FESHCHENKO, G. I.

Battelle Technical Review  
July 1954  
Agriculture

②.  
8098\* Irrigation of Vegetable Crops by Wetting the Root Level Alone. (Russian.) G. I. Feshchenko. *Doklady Vsesoyuznoi Ordona Lenina Akademii Sel'skokhozyaistvennykh Nauk, Imeni V.I. Lenina*, v. 18, no. 1, 1954, p. 41-48.  
Uses force pump, flexible hoses, and introduces organic matter along with water. Tables, graph, photographs.

MAL'TSEV, P.M.; FESHCHENKO, I.M.

Spectrophotometric method for the identification of alcohol  
admixtures. Khar. prom. no.1:41-43 Ja-Mr '65. (MIRA 18:4)



FESHCHENKO, N.G.; ALEKSEYEVA, T.I.; KIRSANOV, A.V.

Alkylation of phosphorus diiodide with higher alkyl  
iodides. Zhur.ob.khim. 33 no.3:1013-1014 Mr '63. (MIRA 16:3)

1. Institut organicheskoy khimii AN UkrSSR.  
(Phosphorus iodides)  
(Alkyl iodides)

FESHCHENKO, I.I.; NAMYATOV, G.N.; VISHNEVETSKIY, M.L.; GLOVATSKIY, A.B.;  
KHAVKIN, V.I.

Putting into operation a sintering department at the Karaganda  
Metallurgical Plant. Stal' 24 no.8:676-678 Ag '64.

(MIRA 17:9)

FESHCHENKO, N.G.

USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour: Ref Zhur - Khimiya, No. 8, 1957, 26878.

Author : Babichev, F.S.; Feshchenko, N.G.;  
Miroshnichenko, Z.I.

Inst : KIEV STATE UNIV. im T.G. Shevchenko

Title : (Bensothiazolyl-2)-Alkylcarboxylic Acids. II.  
6-Nitro and 6-Aminobensothiazolylalkylcarboxylic  
Acids.

Orig Pub: Ukr. khim. zh., 1956, 22, No. 4, 514 - 517.

Abstract:  $\gamma$ -(6-nitrobenzothiazolyl-2)-propionic acid (IV),  
 $\gamma$ -(6-nitrobenzothiazolyl-2)-butyric acid (V),  
 $\delta$ -(6-nitrobenzothiazolyl-2)-valeric acid (VI)  
and o-(6-nitrobenzothiazolyl-2)-benzoic acid (VII),  
reduced to corresponding 6-aminoacids (IVa -  
VIIa) with Sn and HCl were synthesized by the  
condensation of 2-amino-5-nitrophenylmercaptan (I)

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USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour: Ref Zhur - Khimiya, No. 8, 1957, 26878.

with anhydrides of succinic (II), glutaric (III), adipic or phthalic acids;  $\beta$ -(6-methoxybenzothiazolyl-2)-propionic acid (VIII) and  $\gamma$ -(6-methoxybenzothiazolyl-2)-butyric acid (IX) were prepared by condensation of potassium 2-amino-5-methoxyphenylmercaptide with II or III; IVa and VIIa were converted conforming to Sandmeier into  $\beta$ -(6-cyanbenzothiazolyl-2)-propionic acid, melting point 199°, and o-(6-chlorobenzothiazolyl-2)-benzoic acid (yield 56%, melting point 193°), respectively. 6.3 g of I, 3.7 g of II and 15 ml of C<sub>6</sub>H<sub>6</sub> are boiled 1 hour and IV (yield 71%, melting point 163°) is separated; methyl ester (ME) (melting point 170-172°); anilide (A) (melting point 165-167°). The following are produced analogically (the yield

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CIA-RDP86-00513R000412920012-0"

USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour: Ref Zhur - Khimiya, No. 8, 1957, 26878.

in % and melting points in °C of V to VII, their ME and A are enumerated: V - 52, 149, 72-73, 147-148; VI - 63, 94 (from benzene), 127-128, 140; VII - 81, 242, 166-168, 200-202. 1 g of Sn is added to the hot solution of IV - VII in 10 ml of concentrated HCl, it is heated 1 hour, alkalized with 12%-ual solution of NH<sub>4</sub>OH, filtered, the solution is neutralized with diluted HCl and the following are separated (the yield in % and the boiling points in °C of IVa - VIIa and of their benzoates are enumerated: IVa - 79.5, 218, 230; ME, melting point 162°; Va - 77.8, 141, 242; VIa - 55, 133, 163, or VIIa - 55, 133, 163, or VIIa - 83, 210, 252. 35 g of KOH in 130 ml of alcohol is added in three stages to 30 g of 6-methoxyphenylenethiazothionine

Card 3/4

*FESHCHENKO, N.G.*  
KIRSANOV, A.V.; FESHCHENKO, N.G.

Trichlorophosphazenesulfonenitroaryls and the products of their  
hydrolysis. Zhur.ob.khim. 27 no.10:2817-2820 0 '57.

(MIRA 11:4)

1. Institut organicheskoy khimii Akademii nauk SSSR.  
(Hydrolysis) (Aromatic compounds)

FESHCHENKO, N. G., Cand Chem Sci -- (diss) "N<sup>1</sup>-phosphorus derivatives of nitro- and aminophenyl sulfamides." Kiev, 1958. 11 pp (Acad Sci UkrSSR, Inst of Organic Chemistry, Acad Sci UkrSSR), 100 copies (KL, 15-58, 113)

- 9 -

*FESHCHENKO N. G.*

79-2-15/64

AUTHORS: Kirsanov, A. V. , Feshchenko, N. G.

TITLE: Trimethoxy- and Triaroxyposphasosulfonnitrophenyls and Diesters of Nitrophenylsulfonamidophosphoric Acids (Trimetoksi- i triaroksifosfazosul'fonnitrofenily i diefiry nitrofcnilsul'fonamidofosfornyykh kislot)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 339 - 343 (USSR)

ABSTRACT: Trimethoxy- and triaroxyposphasosulfonnitrophenyls (I) and diesters of nitrophenylsulfonamidophosphoric acids (II) were synthesized for the purpose of investigating their insecticidal properties and as a starting point for the production of N-phosphoric acid derivatives of sulfanilamides. (I) was obtained by interaction of tri-chlorophosphasosulfonnitrophenyls (reference 1) with methylate and sodium arylates in a benzene solution (reference 2). Trimethoxy-, triphenoxy-, tri-p-chlorotriphenoxy-, tri-o- and tri-p-trinitro-triphenoxyposphasosulfone-o-, m- and p-nitrophenyls (I) (table 1) were obtained in this manner. (I) represent colorless crystalline substances of a neutral character. They do not dissolve in water. Trimethoxyphosphasosulfonnitrophenyls (III) within one hour saponify on boiling with 96% alcohol to the corresponding diesters (XIV).

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79-2-13/64

## Trimethoxy- and Triaroxyposphasosulfonnitrophenyls and Diesters of Nitrophenylsulfonamidophosphoric Acids

Triphenoxyposphasosulfonnitrophenyls (IV) do not change under the same conditions. Trimethoxy- and triphenoxyposphasosulfonnitrophenyls melt at comparatively low temperatures (from 56 - 104°C). (I) do not saponify upon the influence of aqueous alkaline solutions, which is explained by their insolubility in water. In aqueous alkaline spirit solutions they easily saponify to (II). But (II) can more conveniently be produced from dichloroanhydrides of nitrophenylsulfonamidophosphoric acids (reference 1) by means of the influence of sodium arylates and - methylate in a dioxane solution. Thus dimethyl-, di-p-chlorodiphenyl-di-o- and di-p-nitrodiphenyl ethers of o-, m- and p-nitrophenylsulfonamidophosphoric acids (II) (table 2) were produced. (II) can be eliminated in the form of salts, but it is more convenient in the form of free diesters. (II) represent comparatively high-melting (from 134 - 194°C), crystalline, colorless substances insoluble in water. They melt at far higher temperatures than the corresponding (I), with the exception of two p-nitrophenylethers (XI and XIII) which melt under the corresponding (I). (II) are monobasic acids which exactly tetra- in the presence of phenolphthalein and yield well-crystallizing and water-soluble sodium salts. It is interesting that the sodium salts of the p-chlorophenylethers of nitrophenylsulfonamidophosphoric acids on withdrawal of the water solutions by the ether com-

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Trimethoxy- and Triaroxyposphasosulfonnitrophenyls and Diesters of Nitrophenyl-  
sulfonamidophosphoric Acids

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pletely go over into the ether layer. Sodium salts of other diesters are not withdrawn from the water solution by the ether. There are 2 tables, and 1 Slavic reference.

ASSOCIATION: Institute for Organic Chemistry AS Ukrainian SSR  
(Institut organicheskoy khimii Akademii nauk USSR)

SUBMITTED: December 24, 1956.

AVAILABLE: Library of Congress

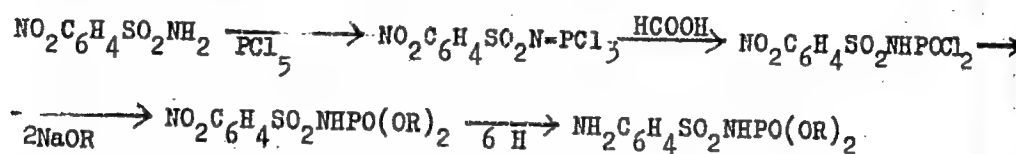
Card 3/3

AUTHORS: Kirsanov, A. V. , Peshchenko, N. G. 79-28-4-43/60

TITLE: Ester of Aminophenylsulfonamido-Phosphoric Acids (Efiry aminofenilsul'fonamidofosfornyykh kislot)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 4, pp. 1049-1052 (USSR)

ABSTRACT: Dimethyl- and diphenyl ester of o-, m-, and p-aminophenyl-sulfonamido-phosphoric acids (formula I) were produced according to the following reaction scheme:



The reduction of diesters of the nitrophenylsulfonamido-phosphoric acids was performed with hydrogen at presence of a palladium catalyst in alcoholic solution at room temperature and at a pressure of ca. 100 torr. The yields were quantitatively. The diester produced by this way form colorless crystals,

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Ester of Aminophenylsulfonamido-Phosphoric Acids

79-28-4-43/60

which have only weakly basic, but strong acid properties. They solve readily in aqueous soda solution and can be titrated as monobasic acids. Their aqueous solutions react acid with Congo red. The dimethyl ester of the aminophenylsulfonamido phosphoric acids are readily soluble in hot water and can be diazotized on the usual conditions (as aniline). The corresponding diphenyl ester are in hot water difficultly to solve, in alcohol more readily soluble. They can be diazotized on the same conditions as aromatic amines with electronegative substituents (e.g. nitroaniline).

The amides of the o-, m- and p-aminobenzenesulfonic acids, to the derivatives of which belong the compounds of the formula I, have little different melting points (153°, 142°, 163°). The lowest melting point has the m-isomeric, the highest the p-isomeric (Ref 3). At the corresponding isomeric compounds of the formula I on the contrary the melting points are far from each other. The highest melting point here has the m-isomeric, the lowest the o-isomeric. The ortho amino-compounds of the formula I are at room temperature very readily soluble in acetone, the para-isomeric only with difficulty and in case of heating. The meta-isomerics are practically

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## Ester of Aminophenylsulfonamido-Phosphoric Acids

79-28-4-43/60

insoluble in acetone. For the strong change of the melting points as well as for the great differences of the solubility in acetone the following explanation is probable: In the case of the o- and p-isomerics intra- and inter-molecular hydrogen bindings form, the formation of which in case of the m-isomerics is complicated or impossible. The influence of the hydrogen bridges upon the melting points of the amides of the aminobenzenesulfonic acids is because of absence of the polarizing influence of the phosphoric acid rest essentially lower; therefore the melting points of the isomerics are close together. For the characteristic of the compounds with the formula I their benzoyl derivatives were produced according to the method by Schotten-Baumann. These compounds form colorless crystals, which have strong acid and no basic properties. Their aqueous solutions react acid with Congo red. The melting points partly are higher and partly are lower than the melting points of the corresponding compounds of the formula I.

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In an experimental part the synthesis and the properties

Ester of Aminophenylsulfonamido-Phosphoric Acids

79-28-4-43/60

of the compounds of the formula I and of their benzoyl derivatives are described exactly. There are 2 tables and 4 references, 4 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii Akademii nauk Ukrainskoy SSR  
(Institute for Organic Chemistry, AS Ukrainian SSR)

SUBMITTED: February 14, 1957

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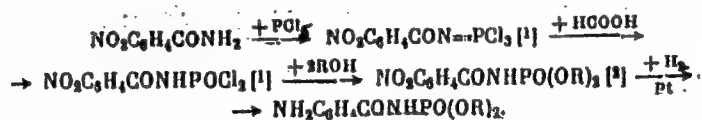
SOV/79-30-1-59/78

AUTHORS: Kirsanov, A. V., Feshchenko, N. G.

TITLE: Esters of Aminobenzoylamidophosphoric Acids

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 1, pp 267-270 (USSR)

ABSTRACT: Esters of aminobenzoylamidophosphoric acids were synthesized according to the following scheme:



Dimethyl and diphenyl esters of nitrobenzoylamidophosphoric acids were obtained by the previously described methods (A. V. Kirsanov, Izv. AN SSSR, OKhN, 1954, 646; A. V. Kirsanov, R. G. Makitra, ZhOKh, 26, 905, 907, 1956, and others). The nitrobenzoylamidophosphoric

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Esters of Aminobenzoylamidophosphoric Acids

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acids were reduced to the esters of aminobenzoylamido-phosphoric acid in an alcoholic solution in the presence of a platinum catalyst. Yields and the properties of the esters are given in Table 1. In order to characterize the above esters, their benzoyl derivatives were prepared by the Schotten-Baumann reaction (see Table 2). There are 2 tables; and 3 Soviet references.

ASSOCIATION: Institute of Organic Chemistry, Academy of Sciences, Ukrainian SSR (Institut organicheskoy khimii Akademii nauk Ukrainiskoy SSR)

SUBMITTED: January 19, 1959

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Esters of Aminobenzoylamidophosphoric Acids

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Table 1. Dimethyl and diphenyl esters of aminobenzoylamidophosphoric acids of the type:  $\text{NH}_2\text{C}_6\text{H}_4\text{CONHPO}(\text{OR})_2$ .

POSITION OF $\text{NH}_2$	R	YIELD (%)	CRYSTALLIZATION MEDIA AND APPEARANCE	MELTING POINT	FOUND N (%)	EMPIRICAL FORMULA	CALCULATED N (%)	SOLUBILITY*				
								$\text{H}_2\text{O}$	$\text{CH}_3\text{OH}$	$\text{CH}_2\text{Cl}_2$	$\text{CCl}_4$	$\text{Acetone}$
o	$\text{CH}_3$	82	water, needles	149-152°	11.49	$\text{C}_9\text{H}_{13}\text{O}_4\text{N}_3\text{P}$	11.48	+	+	-	=	+
					11.60			+	+	-	=	+
m	$\text{CH}_3$	70	alcohol, prisms	125-127	11.24	$\text{C}_9\text{H}_{13}\text{O}_4\text{N}_3\text{P}$	11.48	+	+	=	=	+
					11.07			+	+	=	=	+
p	$\text{CH}_3$	84	alcohol, prisms	169-170	11.32	$\text{C}_9\text{H}_{13}\text{O}_4\text{N}_3\text{P}$	11.48	+	+	=	=	+
					11.21			+	+	=	=	+
o	$\text{C}_6\text{H}_5$	91	70% alcohol, needles	142-144	7.52	$\text{C}_{19}\text{H}_{17}\text{O}_4\text{N}_3\text{P}$	7.61	-	+	+	-	+
					7.42			-	+	+	-	+
m	$\text{C}_6\text{H}_5$	91	70% alcohol, needles	167-169	7.45	$\text{C}_{19}\text{H}_{17}\text{O}_4\text{N}_3\text{P}$	7.61	-	+	-	-	+
					7.43			-	+	-	-	+
p	$\text{C}_6\text{H}_5$	97	benzene or alcohol, prisms	163-164	7.52	$\text{C}_{19}\text{H}_{17}\text{O}_4\text{N}_3\text{P}$	7.61	=	+	-	=	+
					7.42			=	+	-	=	+

\* = insoluble at bp; - slightly soluble at bp;  
+ slightly soluble at 20° and readily soluble at bp;  
‡ readily soluble at 20°

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Esters of Aminobenzoylamidophosphoric Acids

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Table 2. Benzoyl derivatives of the dimethyl and diphenyl esters of aminobenzoylamidophosphoric acids of type:  $C_6H_5CONHC_6H_4CONHPO(OR)_2$ .

POSITION OF $C_6H_5CONH$	R	YIELD%	MELTING POINT
o	$CH_3$	98	162--164°
m	$CH_3$	73	165--166
p	$CH_3$	94	186--188
o	$C_6H_5$	98	171--173
m	$C_6H_5$	86	182--184
p	$C_6H_5$	93	193--195

Card 4/4

FESHCHENKO, N.G.; KIRSANOV, A.V.

Phosphorus iodides. Zhur. ob. khim. 30 no.9:3041-3043 S '60.  
(MIRA 13:9)

1. Institut organicheskoy khimii Akademii nauk Ukrainskoy SSR.  
(Phosphorus iodide)

FESENKO, N.G. ; ROGOZHNIKIN, V.I.

Accumulation of phosphorus and nitrogen compounds in TSimlyansk Reservoir during 1954-1957 and changes in their discharge at the water gauge point of the hydroelectric center. Gidrokhim. mat. 30:10-31 '60. (MIRA 13:9)

1. Gidrokhimicheskiy institut AN SSSR, Novocherkassk.  
(TSimlyansk Reservoir--Water--Composition)  
(Phosphorus) (Nitrogen)

PESENKO, N. G.

Chemical composition of waters of the Northern Donets River in  
its most polluted stretch. Gidrokhim. mat. 30:65-74 '60.

(MIRA 13:9)

1. Gidrokhimicheskiy institut AN SSSR, Novocherkassk.  
(Northern Donets River--Water--Composition)